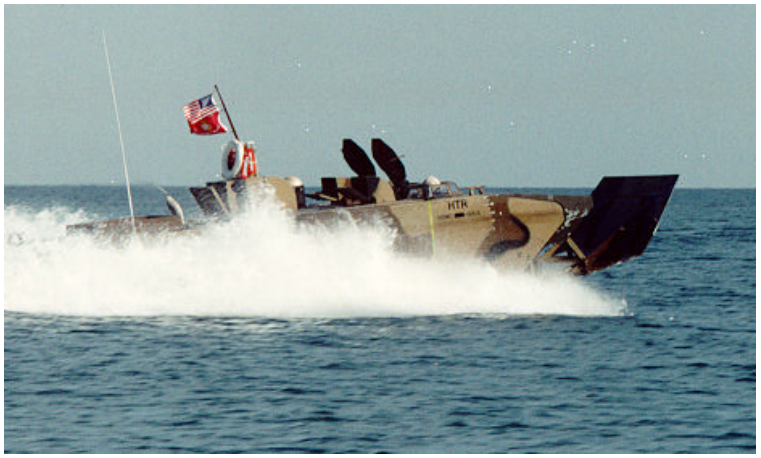
CAIV
Advanced Amphibious Assault Vehicle

PM NARSOC

31 July 1997

Key Performance Parameters



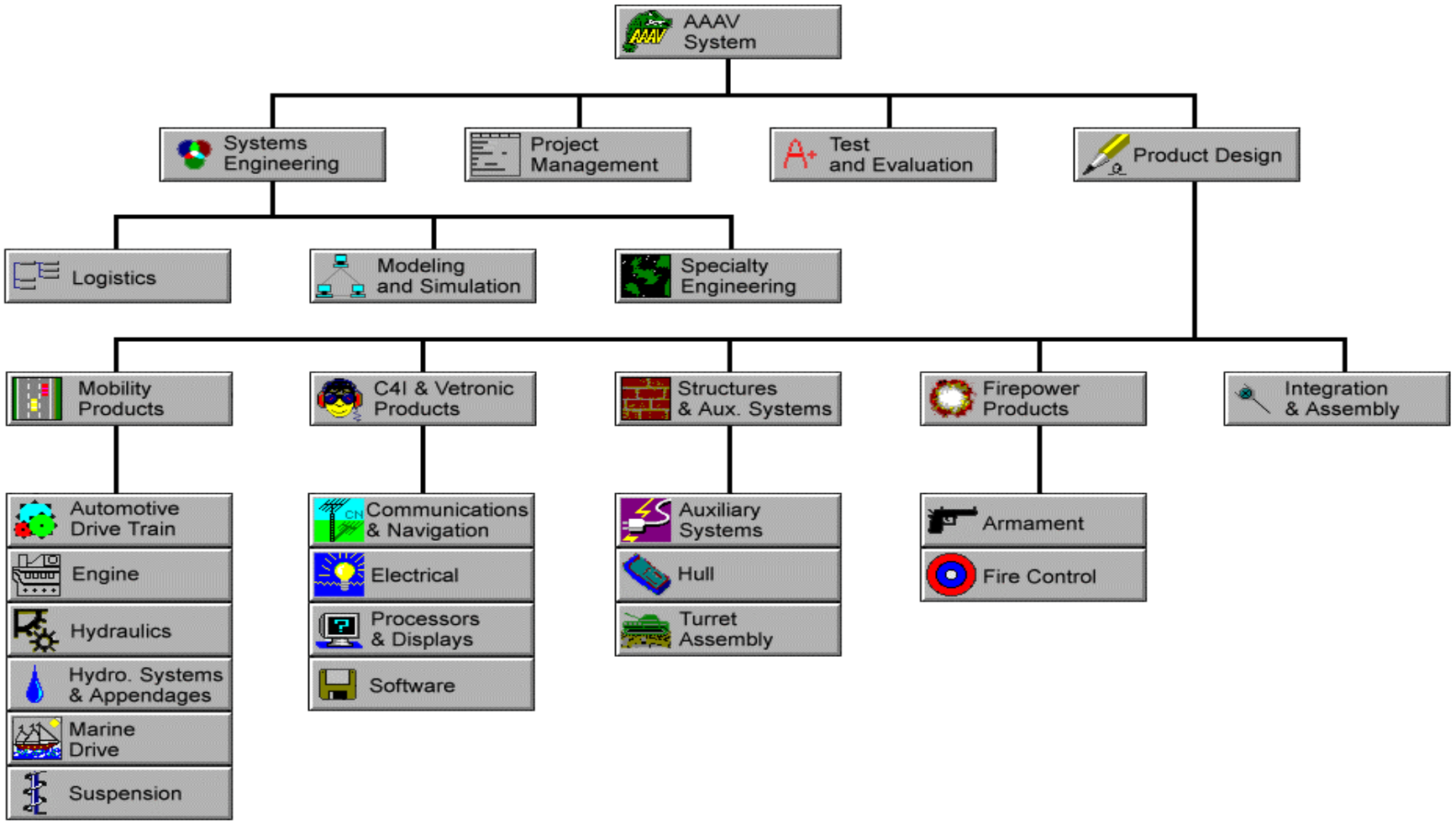
Parameter	Objective	Threshold
High Water Speed (Sea State 3)	25 knots	20 knots
Forward Speed (Hard surface road)	72 kph	69 kph
Armor Protection (MM/M)	30/1000	14.5/300
Firepower (Max Effective Range)	2000	1500
Reliability (MTBCMF)	95 Hours	70 Hours
Carrying Capacity	18 Marines	17 Marines

AAAV CAIV Implementation

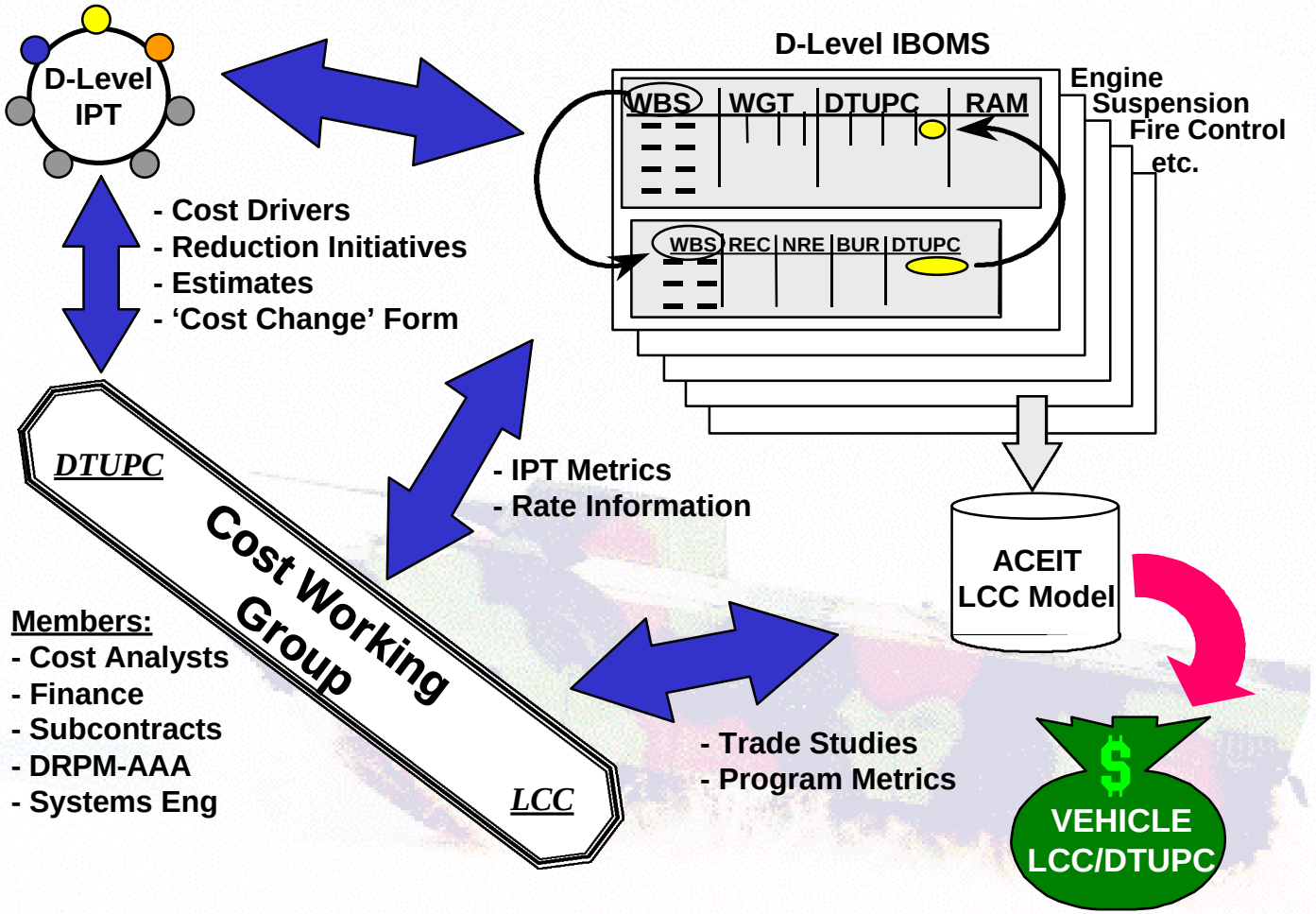
DoN CAIV Cost Reduction Priorities

- Processes and Activities
  - IPTs
  - Information Management
- Requirements Analysis
- Cost Performance Trade Studies
  - Analysis of Design Alternatives
- Performance Trade-Offs

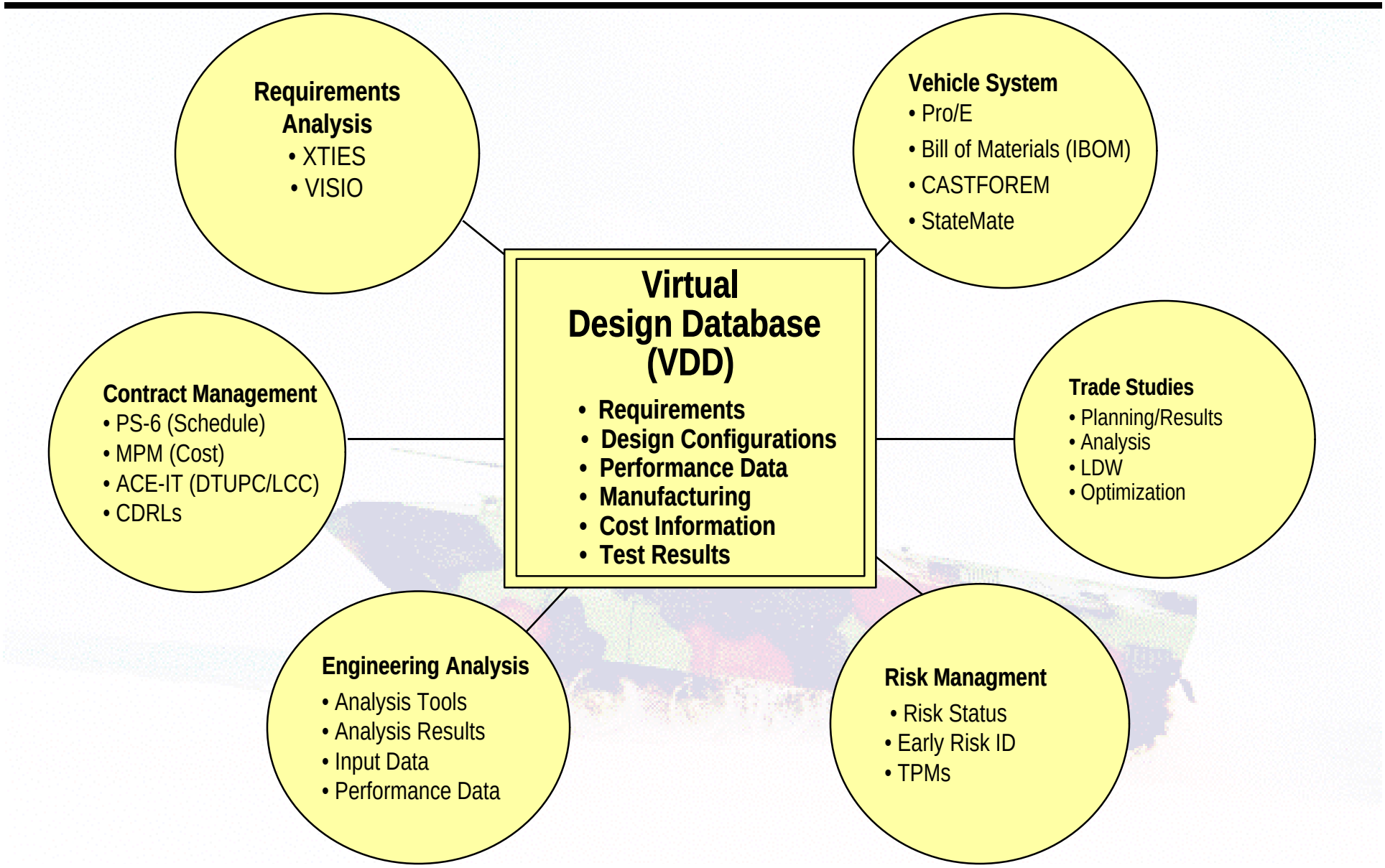
AAAV CAIV Implementation Processes - IPTs



AAAV CAIV Implementation
Processes - IPT Support/Tools



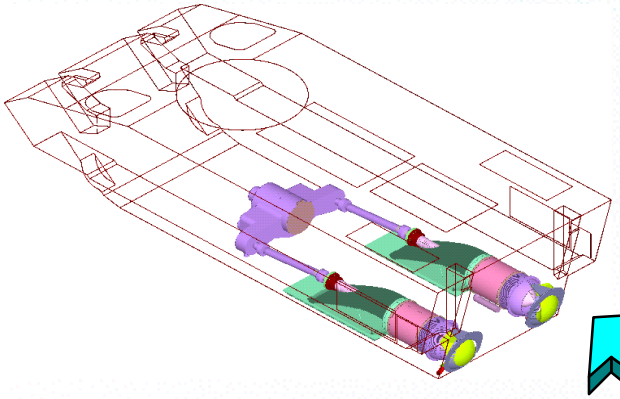
AAAV CAIV Implementation Processes - Information Management



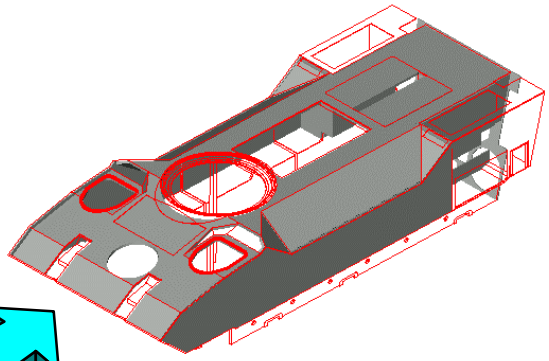
AAAV CAIV Implementation Requirements Analysis

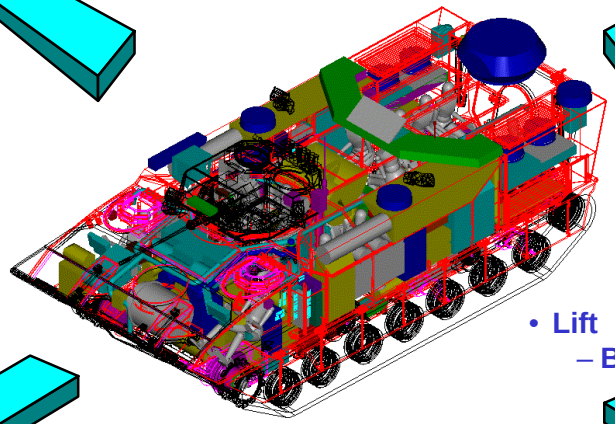
- Requirements Analysis
  - User Involvement
    - Requirements Clarification
    - Operational Analysis - Impact on the Battlefield
    - Performance Specification Development
  - Trade Studies
    - Range of Performance - Above and Below Threshold
    - Operational Effectiveness

AAAV CAIV Implementation Cost Performance Trade Studies



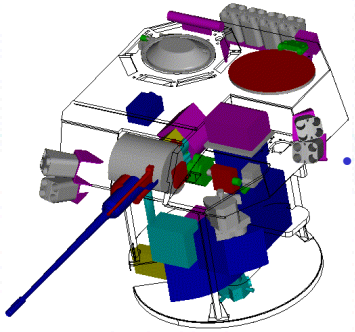
- **Water Mobility**
  - Increase required thrust margin from 7% to 14%
  - 9 knots transition speed required, 10.5 knots desired
  - Minimize reconfiguration depth as a design rule





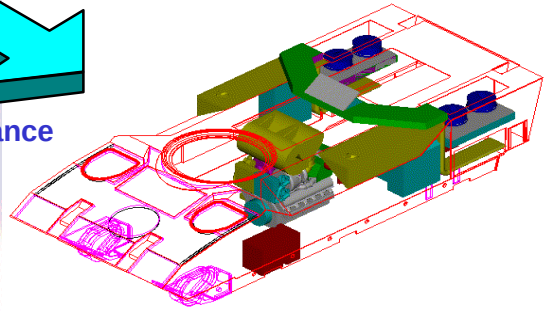
- **Survivability**
  - 14.5 mm armor
  - Reduce signature requirements for prototype
    - * Accept design rules as reqts.
  - Accommodate for overhead smoke
  - Revise nuclear hardening reqts.

- **Lift**
  - Build for 18



- **Lethality**
  - 240x4 FLIR
  - Build to 30 with 35mm growth design
  - Remove missile growth requirement

- **Land Mobility**
  - Capability comparable w/ M1
  - Optimizes cost, weight & performance
    - ⇨Speed: 69 km/hr
    - ⇨Mobility Rating: Nominal
    - ⇨Maximum Tractive Effort: 1.0
    - ⇨Ground Pressure: 8.9 psi.....
    - ⇨Ground Clearance: 16 inches
    - ⇨Land Range: 275 miles w/ 25nm in water



AAAV "Observations" For CAIV

- "Stop Here" - If You Do Not Have a Real Performance Specification
- Cost/Performance Trades Must be Started Early in the Program
- The "Willie Sutton" Rule Will Tell You Where to Start
- Less Than Perfect Cost Models are No Excuse to Delay
  (Perfect = Marginality; See Above
- Engineers are Untrained, Cost Estimators are Too Slow for Engineers
- Establishing a Procurement Cost Objective at MS-I is a Good Idea
  Establishing an O&S Objective (a "Number") before MS-II is Not
- Operational Models are More Important to CAIV Than Cost Models

CAIV Lesson Learned #1

- When You Can Conduct a Detailed Cost Discussion Using Only Operational Terms, You Will Succeed
- Simulating Operational Outcomes of CAIV Alternatives is Critical to Reducing Costs
- Our Combat Models Need A Lot of Work and Granularity
  - But the Warfighter Knows Their Limitations
  - Just Like the Cost Modelers Know Theirs
- Military Judgement Does, and Should Always, Apply

CAIV Lesson Learned #2

- You Must Have a Means to Implement CAIV Opportunities Without Punishing the Contractor <u>After</u> you Baseline Your Contract
  - Assuming, of Course, That the Warfighter Agrees
  - And You Get the Money...